

and shelter. The World Bank estimated the urban poverty threshold in 1975 for the Philippines at US \$180 per capita/annum, Mexico US \$484, and Indonesia US \$125.

2/ The city of Manila occupying 38.0 sq kms. has increased in density from 160 persons per hectare in 1948 to 380 persons per hectare in 1975 which has meant a doubling of population in 27 years and the metro area covers 871 sq. kms. with an estimated current population of 5.8 million. The city occupies less than 5% of the metro area, but accounts for 25% of the low income population.

3/ In 1976 the average estimated daily income for a family of six was U.S. \$2.50. At the same time, the fare for an average journey by bus (about 7.5 km) was U.S. 5.5 cents while the average journey (about 4 km) (2.5m was U.S. 3.5 cents).

4/ An estimated round trip in 1977 from Sapan Palay was U.S. \$0.70 or approximately 25% of his daily U.S. \$2.70 income.

5/ For example, in the case of one of the earliest settlements, Sapan Palay established in 1961 which is located 30 kms north of Manila, 42% of the 19,000 labor force are employed and 4,500 commute daily into Manila at least 1 hour each way at a cost of US 35 cents per trip. (25% of daily income).

6/ Approximately 215 are scheduled for upgrading in the next 3-5 years. Up-grading involves the provision of basic services on site including water sanitation, foot paths and roads and community facilities. Relocation is minimal and the people are provided with building loans to improve their houses. Incentive and assistance are provided for the creation of small scale industry within the area.

DISCUSSION by Thomas B. Deen, Chairman and Executive Vice President, Alan M. Voorhees and Associates, Inc.

The following comments refer to the original papers presented at the Annual Meeting in January 1978 but apply generally to the summaries presented here.

We are fortunate to have such a good selection of papers for this session on transportation planning in cities of developing countries. It's always much easier to be a critic than to create, so I found this to be a very satisfying experience.

Each of the papers approaches the problem from an entirely different perspective: one on basic travel demand characteristics; another with a rather comprehensive land use transportation model that almost makes an effort at embracing the entire urban system; the third paper addresses the physical planning and design of a new town; while the fourth addresses the urban issue as fundamentally one of income re-distribution and ways to carry it out.

I would recommend the paper by Byrne, Tadross and Grava, particularly the discussion of the background of the several new towns that have been built in the last two decades, including Chandigarh (India), Brasilia (Brazil), Islamabad (Pakistan) Ciudad Guayana (Venezuela), and Tenth of Ramadan (Egypt), and, of course, Sadat City (Egypt). This discussion proceeds from the basic philosophy of the designers, their concepts, configurations, planning techniques, and, particularly interesting, the development history and actual experience after development.

The transportation concept described for Sadat City makes much of the use of high densities in order to reduce total motorized mobility requirements and the focus on public transport. Explicit provisions are also made for bicycles, pedestrians, and animal carts, as well as for staging of development over time. One refreshing aspect was the rather explicit statement of the planner's objectives and the response to these objectives. Some aspects of the plans however, despite the best efforts of the designers, may come to naught. The idea, for instance, of intercepting animal carts by putting produce markets at the periphery of the city sounds very similar to the experience of San Jose, Costa Rica a few years ago. The cart owners simply by-passed the peripheral markets and went into the heart of the city where their customers were. Political officials often find it very difficult to enforce regulations against such entrepreneurs.

The designers also claim that the grid system of exclusive busways along with the dispersion of both population and employment will permit balanced loads and a minimum mileage of exclusive busway requirement. However, grid busways often have problems of multiple transfers unless a large number of routes are used, in which case low headways result. The paper unfortunately is silent on the route structure of the buses using the busways.

It should also be noted that the high density may turn out to be a real problem if, in fact, higher incomes and therefore higher motorization comes about. While the exclusive busways should allow for the transit to keep functioning, the high density does reduce the flexibility potential for the future. It's also interesting to note the focus on high density to reduce total travel puts Byrne, Tadross, and Grava on a collision course with Zahavi, as discussed below.

The paper by Zahavi represents another in the series of papers that he has been preparing as a result of his research in comparison of data from many urban transport projects, both in developing and developed countries. He has a unique and innovative way of analyzing this data and has come up with a number of interpretations which tend to confront the conventional wisdom on transportation relationships.

However, I don't know quite what to think about the notion that cars are driven the same distance regardless of city size, speed of travel, density, or any other factor. That spatial cognition is the same for all regardless of cost of travel, time spent, etc., is somehow hard to swallow; yet it appears that his data supports this conclusion. However, he further concludes that "the common belief that the population in a compact city requires less motorized mobility than in a dispersed city is not supported by the facts" seems to be a leap a little bit beyond that supported by his data. Whereas each car may well be driven the same distance in both low and high density cities, in the low density case the higher speeds and less congestion will reduce the cost of car travel and permit more cars to be used; and similarly, the higher costs (both monetary, convenience and congestion) of car travel in high density situations, reduce car ownership and usage. The high densities in Manhattan, for example, are among those factors that influence some of the highest income people in the world to reduce car ownership and usage. In fact, the difference between the car ownership in the developing and undeveloped urban areas shown in Zahavi's data are in the order of four to eight times. Thus, whereas each car may be driven the same distance regardless of city type, if there are four to eight times as many cars per capita, then there will obviously be more motorized travel in a low density city.

While Zahavi's data is primarily for automobiles, he apparently is prepared to accept that this same conclusion is valid for other modes of travel. Given that we are dealing with a phenomenon for which our explanation in terms of human behavior theory is weak, even if Zahavi turns out to be correct for the automobiles, I'll wait to be convinced about bus and other modes until he gets the data.

Perhaps Zahavi's greatest sin comes from his declaration that "no major policy decision with respect to travel or city structures should be taken before we have a better understanding, in quantified terms, of the close interactions between travel demand, system supply, and urban structure." We planners must maintain our humility sufficient to realize that decisions are going to be made whether we understand anything or not, and indeed no decision is also a decision which will have equally unknown results.

Nevertheless, Zahavi has come up with a number of unique contributions to the transportation planning field and I suspect he is on to something with these new analyses and I look forward to the near future when he will doubtless have them sorted out.

Hirten and Echenique's paper is a well written, straight forward description of the background, development, and application of a very comprehensive macro urban model system developed in a remarkably short time. The paper covered all the ground possible in a

45 page effort. However, the cosmic nature of the model cries out for a book instead of a mere paper.

Impressive as the detail are, it would be even more impressive if additional examples were given of how well the model was able to perform. That is, how well its predictions were during the calibration phase with actual observations. It would also be interesting to know the time and costs for each run of the model. Apparently, times and costs are low since some 45 model runs were made within only a few months.

Clearly, the thing that enables Echenique to achieve such remarkable efficiencies comes from the geographical simplifications which he has introduced, both in terms of reduced number of zones, as well as certain network simplifications which are not fully described. This trade off between geographical detail and sectoral disaggregation is one that's most appropriate for macro modelling and I think that probably this is the model's greatest contribution to the state of the art.

We often blame a lack of understanding of system interrelationships as a cause for our planning difficulties. In other words, we are concerned because we can't predict all of the results of various alternative policy courses.

The description of the application of this model, however, and the enormous amount of numerical data generated from the testing of only a few of the potential alternatives for a few time periods makes it evident that even if our understanding of the interrelationships was perfect -- i.e., we had a perfect model and could predict accurately all implications of all alternatives -- we still would have great difficulty in digesting the results, and at the end of the day would still be trading off one set of values against another and/or one group's benefits against another. In this respect, it would certainly have been of interest to see the way in which the model results were used to interact with decision makers and the extent to which it facilitated arriving at rational decisions. Despite all of this, my experience with models suggests that even if they are only partially correct they are enormously instructive because of the enforced discipline in the planner's thinking that is required. This one surely must be useful in this respect.

The paper by Courtney stresses the World Bank's current policy toward urban areas and especially towards transportation in developing areas cities. This means a downplay of much interest in fixed capital facilities, disinterest in new towns (because of their requirements for high initial capital requirements) a stress on management of existing facilities, and on aiming all programs right at the destitute (indicating little faith in "trickle down" theory), and on building only what the poor can afford. Sometimes I think the Bank's emphasis in this respect results, in large measure, from President McNamara's conviction that overall developments "trickle down" benefits to the poor simply don't occur; and, in part, from

the fact that the Bank has difficulty in calculating a rate of return on urban projects that it feels comfortable with, particularly since it doesn't quite know what to do with travel time savings.

Courtney states that the urban problem is a poverty problem and it's without doubt certainly one of the major ones, but the emphasis from the other papers suggests that there are some other aspects of the problem as well.

The entire session with all four papers was interesting, since it's one of the few devoted to the peculiarities of developing countries. Many analysts look at these issues (as our Chairman did in opening the session) and emphasize the many differences between urban areas in developing and developed countries; and these differences truly are numerous. Certainly a blind application of planning techniques from developing countries applied to under-developed situations would be a bad experience (on the other hand, planning techniques that we have applied in developed cities aren't always that great either).

However, just as the bulge in Texas can also be viewed as a dent in Mexico, so one can see the similarities of people regardless of location, city size, or income, requiring travel to obtain the opportunities of the city and trying with their individual constraints to obtain these opportunities with the least expenditure of resources (time and money). Our understanding will doubtless be enhanced as we begin to take a more serious look at urban areas in developing countries, since this will provide us with a wider range of all of the variables that we have been looking at for so many years and doubtless it will also force us to find new ways to disaggregate our data. I suspect, however, that as our understanding grows of these functions, that the similarities between cities will become more evident at the expense of the differences.

YACOV ZAHAVI'S RESPONSE TO COMMENTS BY THOMAS DEEN

1. Car ownership depends on such factors as car costs versus income, and availability of other modes. Hence, the lower car ownership levels in cities of developing countries, or congested cities in developed countries, do not contradict the observation that an available car travels, on the average, the same daily travel distance in practically all cities. It rather strenghtens the conclusion that gasoline savings would be very difficult to obtain by inducing available cars to travel less; the data suggest that higher travel costs reduce car ownership, but not the daily travel distance per available car.

2. The tendency of transit travelers in all cities to transfer to car travel as their income increases suggests that the stable daily travel distance per car reflects an upper limit of satisfied travel demand that applies to travelers in different modes.

3. Travel demand models are currently based on trip rates, with trip distances

being produced as a passive output from the trip distribution phase. These models are not transferable between cities and, hence, may not be transferable over time for any one city, which means that they are not reliable predictors. For example, simulations based on trip rates suggest that changing a given dispersed city into a compact one will reduce the daily travel distance per average car, by reducing the trip distances, thus resulting in gasoline savings. However, this conclusion is not supported by the available data from a wide selection of cities.

4. The purpose of my paper was to call the attention of transportation and urban analysts to new indications, which appear to contradict some of our beliefs and models, and to suggest that we should take these into account before recommending major travel decisions to policy makers.

JOHN COURTNEY'S RESPONSE TO COMMENTS BY THOMAS DEEN

My paper reflects the current thinking on development economics. The objectives presented in the paper are not the sole prerogative of the Bank. Most multi-national and bilateral aid institutions are following a similar pattern and would support the basic premise; that to improve the lot of the lowest income group (the urban poor) through increasing their access to basic goods and services, we have to target the goods and services to this group at a price that is affordable to them and further provide these goods and services in a manner that is replicable within the economic confines of the country and sector.

There has been a long history of aid to the developing world which has improved the lot of the top 10-15% income group and left the position of the bottom 40% unchanged. It is in direct response to this situation that the World Bank and other international lending institutions are now targeting their lending towards this group.

At the present time, poverty lending in urban areas is roughly 5% of the total Bank Group lending of about US \$7.0 billion in 1977. The Bank's ambition in the next five years is to double the urban poverty lending. So rather than downplaying our interest in fixed capital facilities, or in new towns because of their high initial capital requirements -- as Tom Deen suggests -- the Bank is aiming at a balanced program with at least some investments directly benefiting the poor.

The problem which was highlighted in the Manila situation was that the income of the poor are so low (US \$2.50/day) that most families cannot afford the public transport services needed for all their daily activities. Thus the desire to minimize transport need for this group. It is specifically this type of issue which the transport specialist often fails to understand or address in his work. The issues of rate of return, time saved by transport improvements, capital intensive investment alternatives, are peripheral to the issues discussed in the paper. The issue is how can the urban poor's mobility and choice be improved through minimal expenditures on transport. The answer may or may not be a

transport one. Where transport is part of the solution and justification includes time savings then of course the Bank applies the current best state of the art practices, even with the added difficulty of measuring value of time to the populations of the developing countries.

Far from suggesting that the urban problem is only a poverty problem, we are

suggesting that specific attention be given to the needs of this group, particularly as they are such a significant group in many cities, and have largely been neglected in the past. In Manila, they are 35% of the population and Jakarta 55%.

METROPOLITAN REGION TRANSPORTATION

PLANNING: A NEW ERA AND NEW DIRECTIONS

INTRODUCTION, Irving Hand, Institute of State and Regional Affairs, The Pennsylvania State University

This Conference Session presented the views of a mayor (who also has served as Chairman of a regional planning agency), a career public official (with an emphasis on community development), an academician whose work has explored the shape and substance of communi-

ties and why things happen as they do, and an academician whose endeavors center on transportation as services for people and an instrument to achieve community desires. This summary of the session refers to three papers.